

REMARKS

By the above amendment, the title has been amended in a manner similar to, but different from that suggested by the Examiner, informalities in the specification as well as claims 1 and 4 have been corrected, and new dependent claims 6 - 14, dependent directly or indirectly from independent claims 1 and 4 have been presented. Further, a new independent claim 15 and dependent claims 16 - 18 have been presented.

With regard to the objection to the title, applicants have presented a new title, and acceptance thereof is requested.

The rejection of claims 1 - 2 and 4 - 5 under 35 USC 103(a) as being unpatentable over Jeng et al (US 5,772,485) in view of Yanagisawa (US 2002/0151247), and the rejection of claim 3 under 35 USC 103(a) as being unpatentable over Jeng et al (US 5,772,485) in view of Yanagisawa (US 2002/0151247) in further view of Nakamura (JP 62-061028), such rejections are traversed, and reconsideration and withdrawal of the rejections are respectfully requested.

As to the requirements to support a rejection under 35 USC 103, reference is made to the decision of In re Fine, 5 USPQ 2d 1596 (Fed. Cir. 1988), wherein the court pointed out that the PTO has the burden under '103 to establish a prima facie case of obviousness and can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. As noted by the court, whether a particular combination might be "obvious to try" is not a legitimate test of patentability and obviousness cannot be established by combining the teachings of the prior art to produce the claimed

invention, absent some teaching or suggestion supporting the combination. As further noted by the court, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

Furthermore, such requirements have been clarified in the decision of In re Lee, 61 USPQ 2d 1430 (Fed. Cir. 2002) wherein the court in reversing an obviousness rejection indicated that deficiencies of the cited references cannot be remedied with conclusions about what is "basic knowledge" or "common knowledge".

The court pointed out:

- The Examiner's conclusory statements that "the demonstration mode is just a programmable feature which can be used in many different device[s] for providing automatic introduction by adding the proper programming software" and that "another motivation would be that the automatic demonstration mode is user friendly and it functions as a tutorial" do not adequately address the issue of motivation to combine. This factual question of motivation is immaterial to patentability, and could not be resolved on subjected belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher."... Thus, the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion. (emphasis added)

At the outset, applicants note that the present invention is directed to a particular problem in an electron emission type display device, where a display is produced by causing electrons emitted from electron sources to pass through apertures formed in the control electrode and impinge on the phosphors which constitute the anodes, so as to excite the phosphors and generate light. As described at page 6 of the specification, in this type of arrangement, electron emission is performed in a mottled pattern, in that there are positions where the

electron source does not perform electron emission in spots on some portions of the surface of an electron source, and it is difficult to obtain a uniform electron emission from the whole surface of the electron source resulting in low quality of the display. The present invention overcomes these problems of the prior art by improvement of the structure which connects the cathode lines and the electron sources.

More particularly, as illustrated in Fig. 5 of the drawings of this application, for example, and described at page 16 of the specification, a cathode line 5 is formed of silver paste, which is produced by mixing low melting-point glass, which exhibits an insulation property, into conductive silver particles so as to form a thick film of the cathode line 5 which is formed by baking the silver paste. Then, a surface of the thick film which constitutes a contact or connection portion 5b with the electron source 51 is etched by chemical etching so as to remove portions or the whole of the glass component in the surface, whereby the conductor occupancy rate of the connecting portion 5b becomes equal to or more than the insulator occupancy rate thereof. That is, the occupancy rate of the conductor in the connecting portion 5b differs and is higher than the occupancy rate of the conductor of the cathode line 5, whereby, as described, at page 17 of the specification, the conduction between the cathode lines and the electron sources is enhanced, such that conduction is carried out over substantially the whole surface of the connecting portion, thus, enabling the electron emission from substantially the whole surface of the electron sources, and, at the same time, it is possible to obtain a uniform emission quantity for a long period of time. The aforementioned features are recited in independent claims 1 and 15 and the dependent claims, which features are not disclosed or taught in the cited art, as will become clear from the following discussion.

Applicants note that Fig. 6 illustrates an arrangement in which after forming the cathode line 50 in the manner described above, a conductor layer 52 is obtained by applying the paste in which fine silver particles are dispersed to the cathode line 50 and baked so that the conductor layer 52 is formed substantially of only fine silver particles, and with this arrangement, as described at page 18 of the specification, substantially the whole surface of the electron source 51 at the cathode line 50 side is brought into contact with the conductor and electron emission can be realized from substantially the whole surface of the electron source, and, at the same time, a uniform emission quantity of electrons can be obtained for a long time. Thus, the conductor layer 52 serves as a connection portion between the cathode line and the electron source and has a different occupancy rate of the conductor thereof with respect to the occupancy rate of the conductor of the cathode line. Applicants submit that the aforementioned features are recited in independent claims 4 and 15 and the dependent claims of this application, and are not disclosed or taught in the cited art, as will become clear from the following discussion.

In applying Jeng et al to the claimed invention, the Examiner recognizes that "Jeng does not disclose a connecting portion of the cathode line with the electron source has a composition which includes a conductor and an insulator, and the composition is determined such that, an occupancy rate of the conductor is set equal to or more than an occupancy rate of the insulator." (emphasis added). In particular, applicants note that Jeng et al discloses in Fig. 1, a cathode structure 12 which apparently includes a conductive coating 16 representative of a cathode line formed on an electrically insulating substrate 18, a ballast layer 17 illustratively fabricated of amorphous silicon, and electrically conductive microtips 14 provided thereon. Thus, as recognized by the Examiner, assuming arguendo, that the ballast layer 17 of Jeng

et al represents a connecting portion or layer, as recited in claims 1, 4 and 15, there is no disclosure or teaching of the properties of such connecting portion or layer, as recited in the claims of this application.

The Examiner recognizing the deficiency of Jeng et al cites Yanagisawa contending that "part of cathode line (107) where electron source (102) is disposed on of the cathode line (107) with the electron source (102) has a composition which includes a conductor (paragraph 156 "silver particles") and an insulator ... and the composition is determined such that an occupancy rate of the conductor is set equal to or more than an occupancy rate of the insulator (paragraph 156) for the purpose of having better conductivity". (emphasis added). The Examiner contends that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a connecting portion of the cathode line with the electron source having a composition, as defined. Applicants submit that the Examiner has mischaracterized the disclosure of Yanagisawa in relation to the claimed invention, and has engaged in a hindsight reconstruction attempt in an attempt to meet the claim limitations, utilizing the principle of "obvious to try", which is not the standard of 35 USC 103. See, In re Fine, supra.

More particularly, applicants note that each of independent claims 1, 4 and 15 recite the feature of a plurality of cathode lines, a plurality of electron sources which are arranged on the cathode lines in an electrically conductive manner or electrically connected thereto, and "a connection portion of the cathode line with the electron source has a composition which includes a conductor and an insulator, and the composition is determined such that the occupancy rate of the conductor is set to be equal to or more than the occupancy rate of the insulator" (claim 1) (emphasis added), "a layer having a conductor in which the occupancy rate of a conductor is

high is interposed in a connecting portion between the cathode line and the electron source" (claim 4) (emphasis added), or "a connection portion interposed between the cathode line and the electron source for enabling electrically connection therebetween; wherein the connecting portion has a conductor with a second occupancy rate which is different from the first occupancy rate of the conductor of the cathode line" (claim 15) (emphasis added).

Looking to Yanagisawa, while the Examiner contends that the wires 107 represents cathode lines, as claimed, and electrode 102 represents an electron source, applicants submit, however, that Yanagisawa, in paragraph [0082], describes electron-emitting device 113, which emits electrons when voltage is applied thereto through outside terminals, the row directional wire 106 and the column-directional wire 107. As described in paragraph [0072], electrodes 102, 103 are provided for making the electric connection secure between the conductive film 104 and the column-directional wire 107 or the row-directional wire 106. Thus, the Examiner's characterization of the electron source as "102" is considered to be improper. Furthermore, while the wire 107 may have a composition, as indicated by the Examiner, it is noted that the wire 107 forms the cathode line, in accordance with the Examiner's indication, and therefore, Yanagisawa does not disclose or teach a connecting portion or layer which is between the cathode line and the electron source, as recited in independent claims 1, 4 and 15, and the dependent claims. Furthermore, applicants note that while the Examiner contends that Yanagisawa discloses a silver paste comprised of silver particles (whole composition rate was about 78%), glass frit (about 2%), ethyl cellulose base resin binder (about 2%), and organic solvent (about 18%) and that Yanagisawa has a composition with an occupancy rate as claimed, the composition rate of Yanagisawa is a value (wt%?) in

a state of the paste (ink) before the printing and baking processes. Thus, applicants submit the resultant % is not necessarily indicative of occupancy rate, as claimed and is different from the occupancy rate on a surface of the cathode line after the printing and baking process, as obtained with the present invention. Accordingly, applicants submit that Yanagisawa fails to disclose or teach the recited features of independent claims 1, 4 and 15 and the dependent claims thereof in the sense of 35 USC 103. Thus, applicants submit that the proposed combination of Jeng et al and Yanagisawa fail to provide the recited features of the independent and dependent claims of this application, and all claims patentably distinguish thereover.

With respect to the addition of Nakamura et al to the combination of Jeng et al and Yanagisawa, applicants note that irrespective of the disclosure of Nakamura et al, Nakamura et al fails to overcome the deficiency of the combination of Jeng et al and Yanagisawa, as pointed out above, such that this combination also fails to disclose or teach the recited features of claims 1, 4 and 15 and the dependent claims, and all claims should be considered allowable thereover.

As to the newly added dependent claims, applicants submit that such claims more particularly recite features which are not disclosed or taught in the cited art, as well as the function as obtained by the construction as claimed which is also not disclosed or taught in the cited art. Thus, the newly added claims further patentably distinguish over this cited art in the sense of 35 USC 103 and should be considered allowable thereover.

In view of the above amendments and remarks, applicants submit that all claims present in this application should now be in condition for allowance and issuance of an action of favorable nature is courteously solicited.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 501.43506X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP



Melvin Kraus
Registration No. 22,466

MK/jla
(703) 312-6600